21-241 Final Exam Information

1 Logistics

Exam 2 will take place on Monday December 9th from 8:30-11:30am. Although you will have 3 hours to complete the exam, the exam is written to only take 2 hours; it will be roughly twice the length of the in-class exams. 3 hours will give you plenty of time to work through problems and explain your reasoning. You can expect the format of the exam to be similar to the in-class exams. Notes, calculators, and other technology are prohibited.

There will be no problems related to Julia or coding on the exam. The exam is meant to gauge your level of understanding of the mathematics we have discussed in class. As such, you may only use the concepts discussed in class to solve the exam problems.

The exam is cumulative. You might be asked about any of the topics discussed throughout the semester EXCEPT the following applications: Kirchoff's Current Law, error correcting codes (Hamming codes), Cramer's Rule, image compression, the Netflix prize, Principal Component Analysis, and perspective rendering.

2 Review

Recitation on Thursday, December 5th and the final lecture on Friday, December 6th will be review sessions. There will also be a **review video** posted on canvas.

3 How Do I Study?

Start by watching the review video and reviewing the lecture notes, homework, worksheets, and Exams 1 and 2. If you come across a concept, solution, or proof that you do not understand, drop by office hours as soon as you can to clear things up. It is also a good idea to redo any problems from homework, worksheets, and exams that you did not originally know how to do or that you got incorrect.

Once you feel that you have a good understanding of the material, move on to the old exams posted on canvas (including the Exam 1 and Exam 2 practice exams posted earlier this semester) and the additional problems from the textbook listed in the next section. Try to work through these problems **without looking at the solutions or your notes**. After you complete a problem, you can check the solutions to see how you did. If there were particular problems you did not know how to do or that gave you trouble, you can review those concepts again (and come to office hours if you need additional help!).

4 Additional Problems

The following questions are from the 5th edition of Strang's book. See Strang's website (`https://math.mit.edu/~gs/linearalgebra/ila5/indexila5.html`) for the solutions.

- Problem Set 2.3 # 1, 14, 27
- Problem Set 2.4 # 27, 32, 33
- Problem Set 2.5 # 1, 10, 11, 18, 25, 29
- Problem Set 2.6 # 6, 13
- Problem Set 2.7 # 1, 4, 16
- Problem Set 3.1 # 10, 19, 20
- Problem Set 3.2 # 5, 10, 25
- Problem Set 3.3 # 5, 8, 12, 18
- Problem Set 3.4 # 1, 3, 7, 9, 14, 15, 21, 24
- Problem Set 3.5 # 1, 6, 11, 13
- Problem Set 4.1 # 10a, 16, 17-22
- Section 4.1 # 3, 4, 9, 10, 17, 21
- Section 4.2 # 1, 11, 12, 22, 24
- Section 4.3 # 17, 18, 21
- Section 4.4 # 3, 4, 6, 7, 10, 15, 20
- Section 5.1 # 1-3, 12, 14, 28, 29
- Section 5.2 # 12, 16
- Section 5.3 # 12, 16, 19
- Section 6.1 # 4, 6, 12, 15, 19, 32
- Section 6.2 # 1, 2, 4, 11, 12, 15, 16, 19
- Section 6.4 # 7, 10, 12
- Section 6.5 # 7, 9, 18, 20
- Section 7.1 # 1, 7

- Section 7.2 # 5, 7, 13, 15, 17, 18
- Problem Set 8.1 # 1, 3, 6, 8

Want more problems? Do more from the textbook!

5 Exam Instructions

The cover sheet of the exam will have the following instructions. Please familiarize yourself with the instructions so that there are no surprises on exam day.

Before The Exam:

- Do not open the exam until instructed to do so.
- Clearly print your name and andrewID in the designated locations above.
- Place your Carnegie Mellon ID on your desk in front of you.
- Turn off your electronic devices and store them, along with your notes and books, out of sight (e.g. in a closed bag)

During The Exam:

- Your work must be shown clearly and legibly (using a pencil or eraseable pen is always a good idea) and **you must show all work and thoroughly explain your reasoning**.
- Write your solutions only on the pages assigned to the appropriate questions. You may use the extra page(s) at the back of the exam for scratch work or continuing solutions; if you continue your solutions on the extra page(s), you should clearly indicate the page number where the solution is continued so the grader will see it. Do not remove any pages from the staples
- You may not use notes, books, other reference materials, or electronic devices.
- If you need to leave the classroom (e.g. to use the restroom), please raise your hand, turn in your CMU ID card to a proctor, and leave your electronic devices in the classroom.

After The Exam

- Stop working immediately when you are instructed to do so.
- You must hand in your own exam and you must hand in all pages of your exam.

6 Exam Grades

Your scores on any given problem will be based on correctness, legibility, and justification. If an answer is provided without proper justification (whether that mean a proof or calculation), you will not receive full credit.

After exams are graded, it is possible that a grade adjustment (i.e. a curve) will be implemented; such an adjustment (if needed) depends on the performance of the class as a whole. For example, sometimes a given exam is too long for a 50 minute period and students aren't able to finish every problem, leading to low overall grades. See the syllabus for more details.